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and to allow the inhabitants to see out and to fire at attackers. The interior of the dwelling is unpartitioned, constituting a single, long dirt-floored room with a doorway at each end. Floor plan dimensions of several houses were found to range from approximately 25 to 36 feet in width to about 40 to 60 feet in length. A representative house was 27 feet wide by 44 feet long with a maximum roof height of about 15 feet and with walls 7 feet high.

To protect the inhabitants from enemy attacks, the doorways (Figure 1, A, F) are closed with strong hand-hewn wooden doors or removable wooden posts locked into position with a crossbar. An extra layer of chonta palm staves is sometimes lashed to the house wall near the beds. This double wall covers the slits between the palm staves to protect sleeping members of the household from being shot by would-be nighttime assassins. If local feuding is at a particularly high pitch, logs may be laid horizontally against the inside of the house wall to form a breastwork about four feet high. Foxholes are also sometimes dug into the floor to permit firing from low points on the breastwork and to provide shelter for the women and children. A secret escape tunnel occasionally extends underneath the wall, coming up in the garden outside.

Houses ordinarily are occupied five to nine years, even though the gardens are abandoned more frequently, usually after three or four years' use. The chief reason given for abandoning the house after only five or six years is a scarcity of palm fire logs in the immediate vicinity. A dearth of wild game is often a supporting reason for early abandonment. If, however, palm logs and game remain plentiful, the dwelling is normally occupied until it starts rotting. The bases of the wall staves are usually the first parts to decay, but the house often is not abandoned until the roof begins to

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and hands with water from the gourd "bottle." Then the husband, getting up, calls to his wife to bring beer. Having drunk more beer, he lies down on the bed in the men's end of the house. He rests until approximately 5 P.M., while his wife goes to the garden, brings back manioc, and cooks it. He then gets up and tells his wife to bring beer. She carries in calabash bowls of beer. The husband then tells her to bring manioc and meat.

After this meal, his wife brings in a small pot of beer. The men take only two servings of beer apiece, and then converse. They talk about twenty minutes, and take new servings of beer. The wife stays at the side of her husband during these twenty minutes, sometimes participating in the conversation. After this second serving, the wife returns to her end of the house, and the men continue talking until dark. Then the wife brings in a copal torch and lights it. They talk once more and then drink beer again. Finally they finish the pot of beer and the wife returns to her end of the house with it. There she goes to bed, while the men continue their conversation. She rests about half an hour, when her husband calls her to serve beer. She brings a pot of it. The men drink and she remains with them. When they finish the beer, the wife returns to her end of the house, washes out the pot and the calabash serving bowl, and stores them for the night. Then she goes to bed. After half an hour, the men go to bed also, her husband joining her in the women's end of the house, the male visitor sleeping on the husband's daytime bed in the men's end of the house.

For the same household, this is a record of an alternative schedule, on a day when the husband decided to fell trees to make a garden clearing instead of going hunting. The routine up to dawn is similar:

Then he tells his wife of his intention to work clearing trees. She puts a pot of beer into a carrying basket and packs manioc

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and plantains around it. She supports the basket with a tumpline over the forehead, carries an empty cooking pot in her right hand, a firebrand in her left hand, and the axe under her arm. Leaving the children in the house, she sets forth down the trail with her husband, who carries only his gun and his machete.

When they arrive at the spot where trees are to be felled, she fetches wood, makes a fire, and cooks manioc. Her husband starts felling trees. After about two hours he calls for beer. He drinks two or three gourd bowls full and continues working. In about another hour he calls for beer again and drinks a similar amount. He tells his wife to cook meat and continues working. Around noon he goes to where she has been cooking, and asks for beer, drinking three gourd bowls full. She serves boiled meat, putting it, with boiled manioc and roasted plantains, on fresh banana leaves. When they finish eating, he drinks beer again, and returns to his work. He fells trees for about an hour, comes back and drinks more beer.

Then they return home. When they arrive, he sits down on his stool and asks for beer. At about 2 P.M., his daughter and son-in-law, who live a few hundred yards away, drop by and join in drinking beer. They all begin to social-dance and, since there is ample beer brewed, they continue drinking and dancing all afternoon and late into the night. They drink beer continually and do not bother to prepare or eat any food. The children drink beer, too, and munch on cold boiled manioc. By about 3 A.M., everyone has fallen asleep, the daughter and son-in-law staying overnight in the house. They all sleep until early the next afternoon, when they eat.

Hunting is the chief source of protein, and is more important to the food supply than fishing or gathering, contributing an estimated 20 per cent of the diet. A great diversity of botanical and zoological species exists in this region,[1] but this variety is typically accompanied by low density of population for any particular species. This low density sometimes

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tamed, both for personal amusement and for trade to the western or frontier Jívaro to obtain steel machetes, axe-heads, firearms, and ammunition.

Technology and Crafts

No single tool can be considered more ubiquitous in Jívaro life than the machete. The machete is the sole garden weeding implement as well as the only tool used for digging up root crops including the staple food, sweet manioc. It is used for woodworking, to dig clay for pottery, to prepare foods and to cut hair, and it is used to fell even the largest tree, although the less common steel axe is preferred for this task when it is available.

Machetes are of two types: the more plentiful *hapa maĉit* ("deer machete"), of Ecuadorian manufacture, which was formerly obtained at Macas in exchange for one deer carcass, and the *kayeru maĉit* (Collins machete), of North American manufacture and preferred by the Jívaro because of its superior efficiency. The *hapa maĉit* was introduced first, the Collins implement not reaching the Jívaro until about 1941. During the past few decades, large single-bitted steel axe heads have also been introduced in significant numbers by means of a system of Jívaro trading partners. Such axes are still far less plentiful than machetes, but in great demand because of their superiority over machetes in felling trees. Iron adze blades, which were apparently introduced about the same time as machetes, are possessed by only a very few individuals, but are in demand for finishing canoes and stools. All the types of steel tools are mainly obtained by trade from the western or frontier Jívaro of the Río Upano Valley.

As machetes become worn through years of continual use

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• 313
412
241
[177]

The introduction of machetes and steel axes has made woodworking and tree felling more efficient and rapid. The formerly tedious work of felling trees for garden clearings with the aboriginal stone axes has been described by Up de Graff for the Jivaroan "Antipas" (a neighborhood of the Aguaruna or Huambisa) among whom he resided in the late nineteenth century:

> If you saw the one-handed stone axes which are the only tools these people have with which to fell the enormous trees, many of them three to five feet in diameter, to make their clearings (often five acres in extent), you would wonder how it were possible to accomplish this feat. It is a feat of patience rather than of skill. The wood is not cut, but reduced to a pulp, six or eight men working round one tree at the same time.
>
> The first step in making a *chacra* [Spanish: garden] is to remove the undergrowth, the soft stems are cut with hardwood machetes, what can be torn up by the roots is torn up, and the small saplings are snapped off by main force. Then the attention of the workers is turned to the larger trees. A ring is cut round the trunks of all the trees within a radius of, say, a hundred feet of some picked giant, enough to weaken them, and prepare them for the final strain which breaks them off. Finally the giant itself is attacked by a party with axes which works *for days and weeks* [emphasis supplied], until at last there comes a day when the great trunk has been eaten away sufficiently for it to crack and fall. But it does not fall alone, for it drags with it all the smaller trees in its vicinity which are bound to it and to one another by an unbreakable network of creepers among the upper branches . . .
>
> After leaving the trees to lie for several months during the dry season, the Antipas fire them, a process which eliminates all the smaller limbs and bush, leaving only the trunks, to deal with which they have no tools. I have examined the stumps of these

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fallen trees many a time; they resemble in every respect those of a clearing made by heaven.[9]

Today such "giant" trees as referred to by Up de Graff are often felled in a matter of hours by a single man employing a steel axe, or somewhat longer if he only has a machete.

Despite the increased availability of steel axes and machetes for land clearing and weeding in recent decades, the size of forest areas cleared for gardens has not become larger. In fact, garden size and agricultural production are actually reported to have decreased by perhaps a third of what they were several decades ago.[9] Specifically, elderly informants estimate that the present garden size per nuclear family is one half to three quarters of what it was in 1925. They attribute the decline in agricultural production to the disinclination of the young men to clear land "because they do not like to work hard the way their fathers did." Instead, according to the informants, the younger men have their minds fixed on acquiring shotguns, steel tools, and other goods by becoming shamans or trading partners, and also spend more time than formerly in visiting each other's houses, drinking, and engaging in pre- and extra-marital sexual adventures.

There has also been a growing tendency for each household to have several small garden plots rather than the single large garden which was previously typical. This change is attributed to the fact that the steel axe and machete are so much more efficient than the preceding stone tools that a man can now successfully work alone in tree felling without needing to call on his neighbors for help. By avoiding asking them for help, he hopes to maintain better relations with them and thereby secure their services in some more important matter. Since a man usually works alone at intermittent times, the individ-

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from the frontier Jívaro. These firearms are still being obtained in ever greater numbers.

The development of long-distance chains of trading partners between the interior Jívaro and adjacent tribes is an especially noteworthy change, mainly occurring since the end of the Amazon rubber boom, about 1914–15. The impetus for this development was provided by the fact that the end of the rubber boom found the Achuara tribe, which had been much more involved in the rubber trade than the Jívaro, suddenly cut off from their supply of firearms and ammunition. At the same time, trade between the frontier Jívaro and the whites at Macas and Méndez was beginning to develop significantly, and the Jívaro also wanted Achuara products, particularly blowguns and dart poison. The essential result was that both the Jívaro and the Achuara found it profitable to develop mutual trade. To the former inventory of products traded within the Jívaro tribe, such as salt and machete blade fragments, were added new goods coming from the frontier Jívaro on the west, and the Achuara in the east. The new goods primarily have been firearms, gunpowder, increased quantities of steel cutting tools from the frontier Jívaro, and featherwork, blowguns, and dart poison from the Achuara.

In connection with trading partnerships, a minor ritual has been learned from the Achuara tribe. This is the ceremony in which two men embrace each other, kneeling on a cloth, to formalize a partnership relationship. Previously any contractual ritual was unknown.

The now universal demand among the interior Jívaro for firearms and gunpowder has made the men of every neighborhood extremely dependent on those persons who have trading partners in neighborhoods nearer the regions of white settlement in the west. The intensification of the trading